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AREA AIR DEFENSE COMMANDER:
CAN JFACC DO IT ALL?

By

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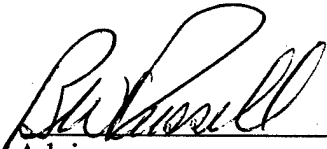
A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract of

AREA AIR DEFENSE COMMANDER: CAN JFACC DO IT ALL?

The last half of the 20th century has witnessed the evolution of air power into a warfare area that is indispensable to the success of the operational and tactical commander. The relationship of the air forces to the naval and ground maneuver forces has often been a point of contention between the armed services and in recent years the offensive aspects of air power have overshadowed the force protection mission.

The introduction of new technologies and the proliferation of theater ballistic missiles and cruise missiles requires the armed services to review the role of air power in relation to the overall mission of the Joint Force Commander. As the size of the armed forces shrinks it will become more important to maximize the synergy between available forces. Joint doctrine needs to evolve with the threat and incorporate technological advances in weaponry and command and control systems. Examining the evolution of air power's role to the joint mission provides insight as to how tomorrow's doctrine can be developed to meet the emerging threat.

Thesis

The ever increasing proliferation of precision-guided munitions, particularly high-speed cruise and ballistic missiles, places a significant burden upon the operational commander to plan and manage force protection for the next conflict. In response to this threat, the Services are developing sophisticated command and control (C2) and weapon systems to facilitate planning, battle management and neutralization of adversary Theater Missiles (TMs). Given this rapidly emerging air threat and multiple C2 and weapon systems to counter it, *can the Joint Force Air Component Commander (JFACC) adequately perform the duties of Area Air Defense Commander (AADC) or should separate commanders be designated to direct offensive and defensive air operations?* In particular, *can a single commander assimilate the vast amount of information that is required to plan and execute both Theater Missile Defense (TMD) and offensive air operations? How should the force be controlled during execution?*

This paper will show that JFACC can manage both operations, but it will require a significant paradigm shift in the selection of JFACC. Joint Doctrine should be revised so that the AADC is JFACC's subordinate not his superior or equal. The JFACC's current Air Defense Cell must become more robust and assume the duty of AADC. The JFACC must remain detached from the myriad of details associated with the generation of the Air Tasking Order (ATO) and Master Air Attack Plan (MAAP) and focus on the larger operational picture vice individual tactical actions. In essence, JFACC needs to have two principal subordinates -- one charged with offensive

actions, Combat Operations, and the other, AADC, charged with force protection - - with JFACC supervising and coordinating their actions.

Introduction

The quantity and variety of theater missiles (TMs) that can threaten forces, regional population centers and critical infrastructures is increasing at an alarming rate. In response to this threat, the conduct of air defense is becoming a focal point for joint operations as force protection takes on greater emphasis.

The armed services are rapidly developing new hard-kill weapon systems and sophisticated command and control (C2) systems to neutralize TMs, but they are struggling with the doctrinal policies and procedures to effectively plan and execute the mission. The development of effective doctrine can be accomplished by examining past applications of air power, incorporating new technologies and applying the principles of war. Combining offensive and defensive air operations under a single commander with broad responsibility offers the flexibility and responsiveness required to successfully win any future conflict and minimize losses.

How we got where we are today.

During World War II the fledgling United States Army Air Force (USAAF) conducted some of its' first major operations in the Mediterranean and North Africa. These U.S. bombers and fighters and their Royal Air Force (RAF) counterparts were parceled out in piecemeal fashion to support ground and naval operations throughout

the theater. Aircraft squadrons were assigned to a ground commander for the duration of a specific operation without considering how they would be employed. This arrangement provided air power to the operational and tactical commanders but it often resulted in heavy losses of allied aircraft and ground forces that were avoidable. A principal reason behind many of these casualties was the improper utilization of aircraft. In numerous cases, medium bombers or fighter-bombers were assigned to targets that would have been better serviced by heavy bombers and failed to neutralize their targets. Fighter escorts for bombers flying into target areas where the Axis forces enjoyed air superiority were often insufficient or non-existent. As losses mounted, the Allies came to the conclusion that allocation of air assets had to be revised.

The first major change was that the RAF Eastern Air Command and the USAAF Eight and Twelfth Air Forces, and later the Ninth, Fifteenth and Thirtieth, were placed under a single commander, Air Chief Marshal Sir Arthur Tedder. From this point on, "air resources were no longer parceled out to subordinate ground commanders but fought according to the airman's principles of mobility and economy of force and in relation to the total, not the local, situation¹." The consolidation of the Mediterranean air forces improved the effectiveness of Allied air power and reduced aircraft attrition from poor employment practices.

While this change greatly reduced aircraft casualties, the ground forces continued to suffer high losses. Tedder and his staff required several months and input from the British Eighth Army and U.S. II Corps to realize that the Allies were fighting two separate wars - one on the ground and one from the air². This situation was resolved in late 1943 and thereafter the air forces supported the ground forces to the

fullest extent possible utilizing the airman's principles. Tedder's deputy, Sir Arthur Coningham best summarized this doctrine:

The Soldier commands the land forces, the Airman commands the air forces; both commands work together and operate their forces in accordance with a combined Army-Air Plan, the whole of the operation being directed by the Army commander³.

Coningham's, summation from 1943 provides the basis to the current relationship between the JFACC and the Joint Force Commander (JFC). The only significant difference between 1943 and the present is that the Joint Force Commander, not the Land Component Commander, dictates the scheme of maneuver for the force as a whole.

The Korean War and Vietnam Conflict brought the widespread use of jet aircraft and Surface to Air Missiles (SAMs). For varying reasons, the hard-learned lessons of WWII were not employed. Once again, aircraft were parceled out by service and geographic regions to subordinate commanders. Following the Vietnam Conflict there were few crises that required a sustained "air operation" of any magnitude until the Gulf War.

Desert Storm was an anomaly in which the opposition made numerous mistakes that allowed Coalition forces months to plan, mass forces and pick the time and place of battle. General Horner, the JFACC during the Gulf War, stated that USCENTAF had actually started planning for an operation similar to Desert Storm in the early 1980's⁴. By the time the war actually started the US had almost ten years to plan and practice the air plan before executing it. JFACC and his staff provided the

JFC with an air plan that supported the JFC's scheme of maneuver while employing the airman's principles. The Iraqi Air Force was no match for the overwhelming force arrayed against it and it was virtually eliminated by the third day of the war. The Iraqi Navy did not fare any better and was also eliminated as an offensive threat early on.

The United States and its' Coalition partners acknowledged the fact that Iraq had ballistic missiles that posed a threat to the Coalition but the Coalition forces lacked any real defensive system capable of defending the force. The Army's PATRIOT missile did engage some Iraqi SCUDS launched at Israel and Saudi Arabia, however the success rate was relatively low⁵ and it was limited to point defense of a few selected areas. Besides the highly publicized SCUDs that struck Israel and Dhahran there were others that received less attention. A single, relatively unsophisticated Iraqi SCUD fired at Al Jubayl landed in the water near the main port facility. It could have decimated the pier and several ships had it landed only a couple hundred yards closer on the dock stacked with ammunition and supplies. Due to their lack of active Theater Missile Defense capability, the Coalition focused over 1,600 sorties on locating and destroying the Transporter-Erector-Launchers (TELs) with very limited success⁶.

While political necessity drove the SCUD hunt, military reality indicated that the quickest path to success was the destruction of the rest of the Iraqi military machine. With the Iraqi Air Force and Navy rendered impotent, the U.S. led Coalition brought the full weight of its capability to bear in *offensive air operations under JFACC's direction* before commencing ground operations. JFACC's performance was instrumental in concluding the conflict quickly with minimal casualties to Coalition forces. Since the majority of current Joint Doctrine was written in the aftermath of the

Gulf War, the *role of JFACC is pre-eminent while the role of the AADC is not as strongly recognized or promoted.*

Current joint doctrine espouses the role of the Area Air Defense Commander (AADC) as being a commander subordinate to the Joint Force Commander (JFC) charged with responsibility for the theater/Joint Operations Area air defense including active Theater Missile Defense (TMD)⁷. It also recommends that when an AADC is established he should be dual-hatted as the Airspace Control Authority (ACA) and JFACC. Doctrine allows the JFC the flexibility to separate AADC and JFACC but does not provide any guidance for a recommended command relationship between these subordinate commanders who have overlapping missions.

The ACA is responsible for developing the Airspace Control Plan and modifying it as necessary to maximize airspace use by the entire force in response to dynamic battlefield events. Under joint doctrine two principal duties of the JFACC are development of the Master Air Attack Plan (MAAP) and the Air Tasking Order (ATO). Recent practice and literature both indicate that these functions are viewed primarily as offensive responsibilities by the four services⁸. The JFACC staff has an Air Defense Cell that consists of liaison officers from the various services, but its primary focus has been on offensive and defensive counter-air operations involving the use of manned aircraft and not the integration of surface to air missile (SAM) systems and aircraft. Joint Doctrine strongly recommends the establishment of a JFACC but tends to view the AADC as a position necessary only in larger conflicts.

Following the Gulf War, the next major crisis erupted in the Adriatic among the warring factions of the former Yugoslavia. When offensive military action was finally undertaken, General Ryan, AIRSOUTH, was appointed as JFACC. While there was an air threat from both aircraft and SAM systems, the focus of this action was on quick strikes to force Bosnian Serb compliance with UN Peace Enforcement agreements. The General and a couple of his key staff officers focused themselves on the development of the MAAP and ATO. The operation was successful in forcing Bosnian Serb compliance, however it also saw the Operational Commander immersing himself in details to the exclusion of many of his duties. Some of his staff officers and observers commented that if the operation had continued much longer they would not have been able to sustain their activity because of fatigue among this small cadre of officers⁹. Once again the focus was on offensive actions with little attention directed at defensive considerations.

In future conflicts a potential adversary can be expected to take the lessons learned from the Gulf War and Balkans, minimize the amount of time U.S./Combined Forces have to prepare and employ air defense assets, and maximize the use of his own offensive weaponry. The JFC must be ready to immediately counter the air threat with a robust force protection plan that complements the offensive scheme of maneuver.

What the future holds

JFACC's ability to successfully plan and execute offensive operations has been amply demonstrated over the past decade. The role of the AADC has not been as

crucial to the JFC's mission because the adversary lacked the capability to seriously threaten U.S. forces, as in the Balkans, or ineffectively employed his assets, as occurred during the Gulf War. That situation is quickly changing and force protection will soon have an equal or greater role in the success of future operations.

Theater ballistic missiles and cruise missiles are quickly becoming the weapon of choice for third world countries to achieve a degree of parity with the United States and other nations possessing sophisticated air forces. The speed and effectiveness with which the United States and Coalition air forces defeated the Iraqi air force caused most third world countries to realize that they do not have the resources to acquire and field an air force capable of competing with fourth and fifth generation aircraft. These countries are also realizing that the same investment, or even less, applied to theater missiles gives them an effective, offensive weapon system that does not require a large air force with highly trained pilots. Over 30 countries now possess short to medium range ballistic missiles and the number will continue to grow.¹⁰ The accuracy of these weapons will also improve as Global Positioning System and/or GLASNOST capabilities are incorporated into the guidance systems¹¹. This shift in focus of potential adversaries must be reflected in joint doctrine. To assume that the United States can discount a future adversary's air power in the form of either fixed wing aircraft or missiles is to invite disaster.

The Armed Forces of the United States are developing a variety of weapon systems and C2 systems to counter the TM threat. The Army Patriot PAC-2/3 and Navy Area Defense (NAD) SM-2 BLK IVA will provide lower tier ballistic missile and cruise missile defense. The Theater High Altitude Air Defense (THAAD) and

Navy Theater Wide (NTW) SM-3 will provide upper tier ballistic missile defense, while the Air Force airborne laser will provide Boost Phase Intercept capability. Among the weapon systems, the Army PATRIOT PAC-2 is the only system currently in service with any capability against TBMs. In the very near future, the PATRIOT PAC-3 and NAD systems will be available and within the next decade the NTW , THAAD and Airborne Laser systems should be available.

In addition to the weapon systems, a variety of new command and control systems are being fielded. The Joint Tactical Information Distribution System (JTIDS) is providing the backbone for connectivity between individual units and higher echelon commanders until the Joint Data Network is fielded. The Army's Ground Based Radar (GBR) will provide the sensor and C2 system to employ THAAD and PATRIOT in TMD. The Air Force's Joint Tactical Ground Stations (JTAGS) are intended to provide connectivity with Defense Support Program satellites that are capable of detecting missile launch indications and cueing other sensors. The Navy's Cooperative Engagement Capability (CEC) provides a sensor netting and C2 system that provides accurate detection, cueing, tracking and impact prediction. CEC will be the backbone for the future Joint Composite Tracking Network.

Why does it matter which of the aforementioned systems are available to the JFC? The answer lies in the defended footprint each system will provide, how those footprints and C2 connectivity affect placement and employment of these systems and how those decisions must be integrated with the rest of the joint force. To achieve the greatest massed effects on the adversary, the AADC must achieve synergy with the forces assigned to build an integrated air defense system (IADS). Every IADS that the

United States has fielded in the past few decades has actually been an amalgamation of disparate "bubbles" centered around a single service component and in worst case, individual units within a service. These bubbles were loosely connected together through an ad hoc C2 system but for the most part acted independently of one another and failed to realize joint force synergy.

Another dilemma for the Joint Force Commander is what mission will drive the placement of these assets? Political necessity may require positioning certain assets near population centers vice in areas better suited to maximize force protection. Most of these systems and/or their associated platforms are multi-mission capable. The JFC will have to prioritize the mission tasking for these assets since some missions may be mutually exclusive. For example, an Aegis Cruiser tasked with providing area air defense for a port facility may also be needed for sea control and strike missions. While the ship is capable of conducting all three missions, the C2 and weapon systems to be employed for each mission may limit where the ship can execute them.

Redefining JFACC

The threat posed to the joint force in the form of theater missiles requires a re-examination of joint doctrine and joint force organization. Joint Pub 3-01.5 recommends that the JFC select the component commander with the preponderance of air defense assets as AADC. Planning for theater missile defense, and air defense in general, resides with the AADC, but the command and control of those forces is through individual service components commanders. This same joint pub also recommends that the JFC select the component commander with the preponderance of

air assets as JFACC. (See Figure 1) The JFACC is tasked to generate the MAAP and ATO and to exercise C2 of the air forces placed at his disposal. Current doctrine does little to reconcile this dichotomy between the AADC and JFACC. The JFC is given the flexibility to organize his forces to most effectively execute his mission but is not given much guidance as to what organization might best fit a particular situation.

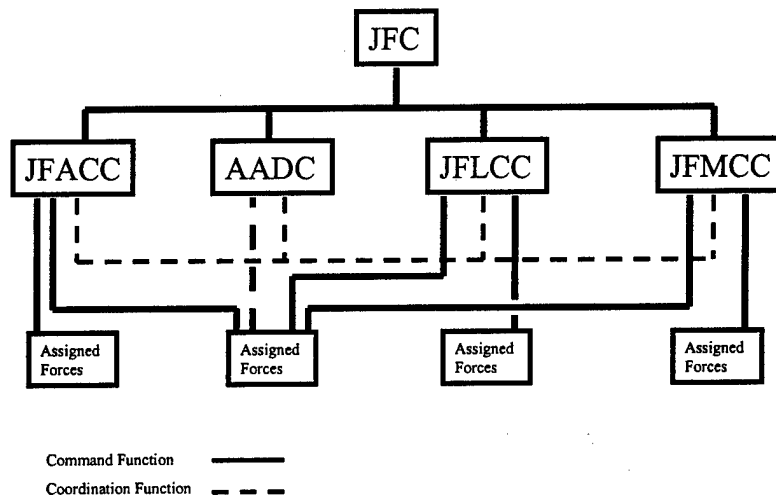


Figure 1. JFACC and AADC as Separate Commanders Under Current Doctrine

Several different viewpoints exist as to what is the best organization for conducting force protection from TMs. One point of view that has been proposed as a viable solution would place all TMD assets under a Theater Missile Defense Component Commander (TMDCC) exercising centralized command and control of assigned forces¹² (See Figure 2). Proponents argue that this would provide a single commander focused on the TM threat, but it would actually lead to establishment of another chain of command competing with the AADC, JFACC (if separate from AADC), Ground Component Commander and Naval Component Commander for

control and positioning of assets. For example, when TELs are detected would they fall under JFACC's offensive counter air responsibility or would they be the TMDCC's responsibility? If they are TMDCC's and he does not have any offensive counter air aircraft available how difficult will it be to get assets from JFACC? Who gets priority for tasking naval assets carrying both TLAMs and TMD weapons? To further exacerbate the situation, the use of centralized command and control greatly increases the possibility of missing an engagement through a breakdown in connectivity or human error on TMDCC's staff.

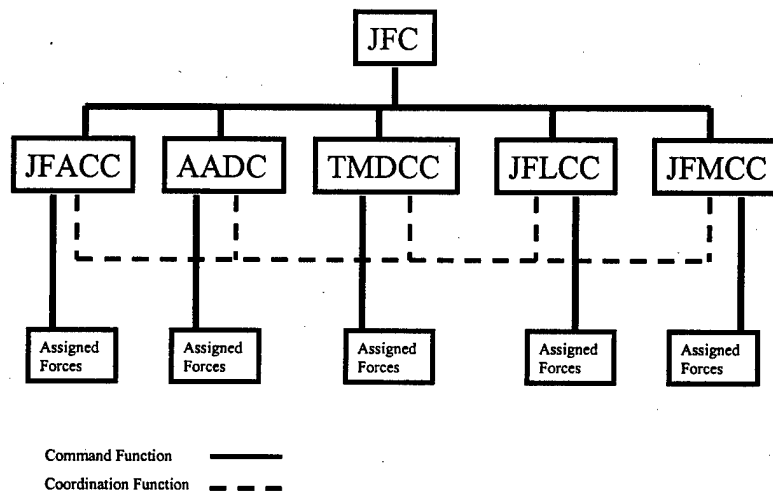


Figure 2. JFACC, AADC and TMDCC as Separate Commanders Exercising Command and Control

Others view TMD planning and execution as AADC's mission but feel that JFACC and AADC should be two separate commanders¹³(See Figure 3). Joint doctrine allows the operational commander this flexibility and it would put all air defense operations under a single commander and offensive operations under another. This would allow each commander to focus on his area of responsibility, but like the

TMDCC concept it results in separate and distinct chains of command with overlapping responsibilities that will be competing for the same resources. Both these concepts also fail to address the issues of deconfliction and coordination when two separate commanders are trying to respond to a threat in the same geographic area. The net result will be a loss of unity of command and effort, and a reduction in economy of forces.

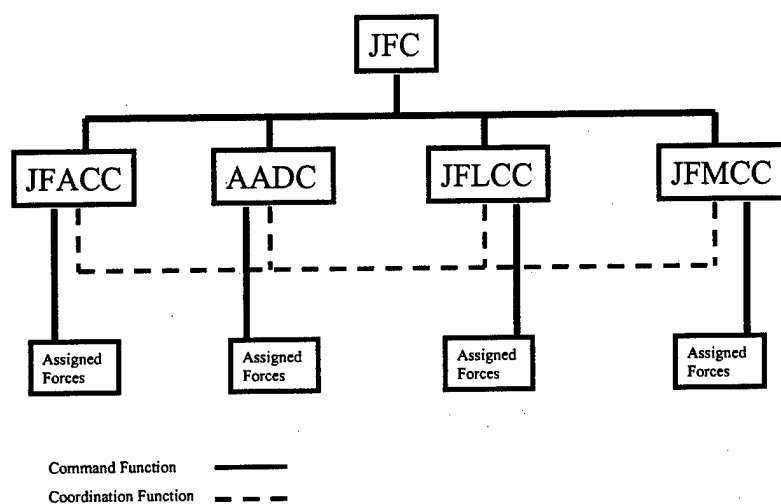


Figure 3. JFACC and AADC as Separate Commanders Exercising Command and Control

The problem with these proposals and current doctrine is that they are guided by parochial views as to what service will provide the AADC or JFACC. These proposals also reduce the likelihood of achieving synergy since the available forces are distributed among two or more commanders.

Near term active TMD will be primarily the use of SAM's to destroy any missiles- -cruise or ballistic- -in flight. TMD Attack Operations and offensive air actions in general will be a combination of SAM's, Surface to Surface Missile's,

artillery and aircraft. Making JFACC the component commander with the preponderance of assets that match the overarching mission of the JFC and establishing two principal deputies, one for offensive actions (Combat Operations) and one for force protection (AADCC) offers a new solution. Utilizing JFACC as the commander overseeing the MAAP, ATO and Air Defense with two principal deputies offers a number of advantages. JFACC can coordinate with the Joint Force Commander to evaluate the situation as it unfolds and redirect assets between his deputies while maintaining the "big picture". This will also allow JFACC more freedom to coordinate with the other component commanders and JFC to ensure that air operations are executed in a synergistic fashion that supports the ground scheme of maneuver. Combining the offensive and defensive actions under a single commander will facilitate planning and execution and greatly reduce the competition for resources. Unity of Command, Economy of Forces and Unity of Effort can be achieved much easier. (See Figure 4)

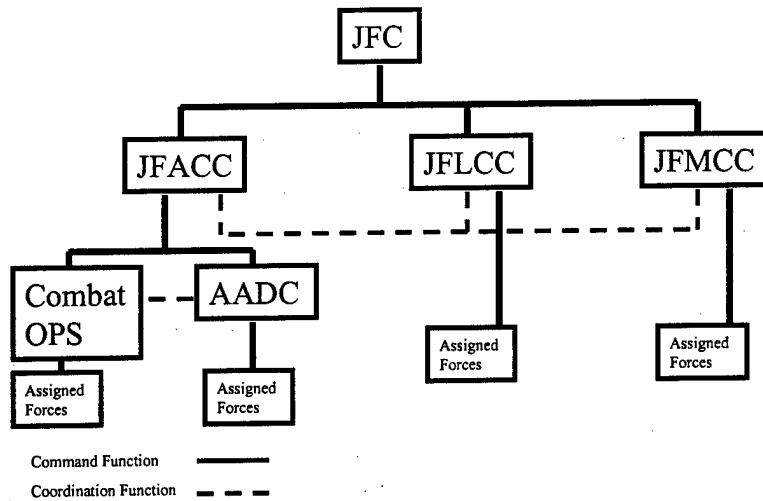


Figure 4. Proposed New JFACC Organization Exercising Command and Control

The organizational structure proposed above requires centralized planning and decentralized execution for both offensive and defensive operations. Joint doctrine is replete with this idea however the reality is that technological advances in communications permitting near real time connectivity with forces located throughout the world has brought about the tendency for higher echelon commanders to exercise control of assigned forces down to the tactical level. This may be necessary in some circumstances but in the area of TMD it can lead to disaster. Joint Vision 2010 and Network Centric Warfare envision providing the Commander's Guidance and situational awareness of the battlefield down to the unit level. The goal of these C2 endeavors is to enable lower echelon commands and tactical units to become self-synchronizing with the overall mission envisioned by the JFC¹⁴, not to provide a mechanism for centralizing command of the entire battlefield. Individual unit commanders must be allowed to exercise control over engagements. Ballistic missiles in flight currently have an engagement window measured in seconds. The systems of

the future will expand this window to a few minutes but if unit commanders are conditioned to act only upon direction and/or authorization from higher authority the risk of missing an engagement will increase substantially.

This concept poses some disadvantages to other proposals. JFACC will be responsible for a significant portion of any operation and may become over-tasked. The tendency to add additional personnel as staff functionaries could result in an organization that is too large and bureaucratic to quickly and effectively respond to high tempo operations. This difficulty can be overcome by aggressively reviewing personnel assignments to ensure that only mission essential personnel are assigned to JFACC.

A second disadvantage is that this organization represents a critical C2 node that could be exploited by an adversary. Adequate measures must be taken to ensure that neither a deliberate attack nor a "lucky shot" is able to neutralize it.

A third potential problem is that the JFC could select a non-aviator as JFACC who is extremely well versed in TMD but lacks sufficient expertise with aircraft operations. The opposite case is also possible. By forming a balanced staff with equal representation from the aviation and TMD communities a reasonable compromise can be achieved that provides the JFC with a JFACC capable of executing the full spectrum of missions. In certain scenarios, it may actually be to the JFC's advantage to have a JFACC who is more experienced in TMD than aircraft operations.

Conclusions

The experiences of the USAAF and the RAF in World War II demonstrated that to maximize the effectiveness of air power all air assets should be consolidated under the control of a single commander. That commander must apply the airman's principles of mobility and economy of force to the utilization of air assets and work in conjunction with the ground forces' scheme of maneuver to achieve the greatest synergy and mass effects against an adversary. Technological advances in weaponry and C2 systems have changed the complexion of the air war however the principles governing the use of air power remain applicable even in the era of theater missiles.

As theater missile defense, particularly Ballistic Missile Defense, grows in importance, force protection operations will require more effort and may become the limiting factor in any future conflict. Breaking the paradigm that JFACC must be from the service component with the greatest percentage of aircraft is necessary to provide the JFC with an option to successfully counter a future adversary who may rely more heavily upon missiles than manned aircraft.

Joint doctrine should be revised to place greater emphasis on the force protection aspect of air operations. The current roles of AADC and JFACC should be subordinated as deputies to a new JFACC who has broad responsibilities for offensive and defensive air operations. This new JFACC organization would have the resources and capability to conduct coordinated planning and rapid asset re-allocation under a single commander in response to a dynamic battlefield environment. Implementing this change in doctrine necessitates a significant paradigm shift from current doctrine

but offers substantial movement towards achieving Unity of Effort, Unity of Command, Economy of Forces and Synergy.

Notes

¹ Air Historical Group, United States Air Force, The Army Air Forces in World War II: Volume Two – Europe: Torch to Pointblank (Chicago: University of Chicago Press, 1949), 113.

² Warren Tute, The North African War (New York: Two Continents Publishing Group, 1976), 132.

³ Sir Arthur Coningham, quoted in Air Historical Group, United States Air Force, The Army Air Force in World War II: Volume Two – Europe: Torch to Pointblank, 164.

⁴ Charles A. Horner, “Air Campaign (Of Desert Storm)” Military Review, September 1991, 16-20.

⁵ Ronald R. Fogleman, “Theater Ballistic Missile Defense” Joint Force Quarterly, Autumn 1995, 75.

⁶ Ibid. 76

⁷ Joint Chiefs of Staff, Doctrine for Joint Theater Missile Defense, (Joint Pub 3-01.5) (Washington, D.C.: 22 February 1996), GL-2

⁸ Albert R Hochevar et al., “Deep Strike: The Evolving Face of War” Joint Force Quarterly, Autumn 1995, 80-85; Robert C. Owen, “Balkans Air Campaign Study, Part 2” Airpower Journal, Fall 1997, 11,20;

⁹ Robert C. Owens, “Balkans Air Campaign Study, Part 2”, 22.

¹⁰ Duncan Lennox, “Threats – Development and proliferation of Ballistic and Cruise Missiles” Theater Missile Defense: Systems and Issues, (Washington: American Institute of Aeronautics and Astronautics, 1994), 29.

¹¹ Paul G. Kaminski, “DOD’s Ballistic Missile Defense Strategy” Defense Issues, 1996

¹² M.S. Hill, “Posture for Operational Success: Create the Theater Missile Defense Component Commander” (Unpublished Research Paper: Naval War College, Newport RI 7 February 1997, 10.

¹³ William L. Spacy II, “Command and Control of Theater Missile Defense: Joint Doctrinal Imperative” (Unpublished research Paper, U.S. Naval War College, Newport RI 7 February 1997), 9

¹⁴ Chairman, Joint Chiefs of Staff, “Concept for Future Joint OPS: Expanding Joint Vision 2010” May 1997, 39-40

Bibliography

Air Historical Group, United States Air Force, The Army Air Forces in World War II: Volume Two – Europe: Torch to Pointblank, Chicago: University of Chicago Press, 1949.

Barnaby, Frank, "Restrained Reply: Defying a Limited Ballistic Missile Attack" Jane's International Defense Review, June 1998, 69-73

Chairman, Joint Chiefs of Staff. Concept for Future Joint OPS: Expanding Joint Vision 2010, Washington, D.C.: May 1997

Chairman, Joint Chiefs of Staff. Joint Vision 2010, Washington, D.C.: May 1997

Fogleman, Ronald R. General USAF, "Theater Ballistic Missile Defense" Joint Force Quarterly, Autumn 1995, 75-79

Foxwell, David and Lok, Joris Janssen "Naval TBM Defense Matures" Jane's International Defense Review, January 1998, 28-30

Goodman, Glenn W., "Sea-Based Firepower" Armed Forces Journal, November 1997, 34-37

Hill, M.S. . "Posture for Operational Success: Create the Theater Missile Defense Component Commander." Unpublished Research Paper, U.S. Naval War College, Newport RI: 7 February 1997.

Hochevar, Albert R., Robards, James A., Schafer, John M., and Zepka, James M., "Deep Strike: The Evolving Face of War" Joint Force Quarterly, Autumn 1995, 80-85.

Horner, Charles A., Lieutenant General USAF, "Air Campaign (Of Desert Storm)" Military Review, September 1991, 16-27

Houle, Edward H., Colonel USMC, "JFACC: The Sequel" Marine Corps Gazette, May 1993, 83-89

Hurley, Marcus, "JFACC: Taking the Next Step" Joint Force Quarterly, Spring 1995, 60-65

Hutchinson, Scott T., "Army and Navy Theater Missile Defense: Protecting the Force" Military Review, March-April 1995, 50-57

Joint Chiefs of Staff. Command and Control for Joint Air Operations, (Joint Pub 3-56.1) Washington, D.C.: 14 November 1994

Joint Chiefs of Staff. Doctrine for Joint Airspace Control in a Combat Zone, (Joint Pub 3-52) Washington, D.C.: 22 July 1995

Joint Chiefs of Staff. Doctrine for Joint Operations, (Joint Pub 3-0) Washington, D.C.: 1 February 1995

Joint Chiefs of Staff. Doctrine for Joint Theater Missile Defense, (Joint Pub 3-01.5) Washington, D.C.: 22 February 1996

Joint Chiefs of Staff. Joint Doctrine for Theater Counter Air Operations, (Joint Pub 3-01.2) Washington, D.C.: 1 April 1986

Kaminski, Paul G., "DOD's Ballistic Missile Defense Strategy" Defense Issues, 1996 Volume XI Number 25

Laird, Robbin, "Present at the Creation: TMD Strategy evolves to meet a proliferating threat" Sea Power, October 1997, 47-50.

Lennox, Duncan "Threats – Development and Proliferation of Ballistic and Cruise Missiles" Theater Missile Defense: Systems and Issues, Washington: American Institute of Aeronautics and Astronautics 1994, 29-36

Litchfield, Bruce A., Major USAF. "Theater Ballistic Missile Defense: The Need for an Operational Commander." Unpublished Research Paper, U.S. Naval War College, Newport RI: 16 June 1995.

Orton, William D., "Joint Force Air Component Commander: Transitioning from Afloat to Ashore" Unpublished Research Paper, U.S. Naval War College, Newport RI: 7 February 1997.

Owen, Robert C, Colonel USAF, "Balkans Air Campaign Study, Part 2" Airpower Journal, Fall 1997, 6-26.

Soofer, Robert M., "Joint Theater Missile Defenses Strategy" Joint Force Quarterly, Autumn 1995, 70-74

Spacy, William L., II, "Command and Control of Theater Missile Defense: Joint Doctrinal Imperative" Unpublished Research Paper, U.S. Naval War College, Newport RI: 7 February 1997.

Stambaugh, Jeffrey E., Major USAF, "JFACC: Key to Organizing Your Air Assets for Victory", Parameters, Summer 1994, 98-110

Starr, Barbara, "Airborne Laser Breaks through the Barriers" Jane's Defence Weekly, 10 September 1995, 53-54

Tute, Warren, The North African War, New York: Two Continents Publishing Group, 1976

Whitlow, J.L., Colonel, "JFACC: Who's in charge?" Joint Force Quarterly, Summer 1994, 64-70